

B7 Timing Relay - D5455/B7

Delayed Operation Relay

- Electronically controlled version of the high integrity D2600 Series relay with adjustable delay-to-operate time settings.
- Time delay adjustable from 1 second to 64 minutes (in 6 preset ranges).
- Combinations of 4 volt free normally open or normally closed contacts in a choice of contact materials.
- Extensively used throughout the Power Industry for power, switchgear and safety related systems.
- Fully compatible with the D2600 Relay & Socket system.
- Dual voltage (AC/DC) operation (via internal bridge rectifier).
- Fouling pins fitted as standard for Interchangeability protection.



1. Technical Data

Operate Supply:	DC or AC input: Operating (coil) voltages available: Voltage Tolerances: Release (approx% of Min. Op Volts): Coil Power (nominal):	Full wave bridge rectified internally to DC 12V, 24V, 36V, 50V, 110V or 240V +10% -20% DC or AC (50Hz to 110Hz) AC 70% (or less), DC 25% (or less). 3.5W DC.
Operate Times:	Repetitive accuracy (pull in): Drop out:	±0.5% at constant operating conditions = 35ms Maximum.
Voltage Withstand: (IEC 255-5:1977)	1KV rms 50Hz for 1 minute across open contacts. 2KV rms 50Hz for 1 minute between:	a) current carrying parts and frame b) contact sets c) coil and contacts.
Insulation: (IEC 225-5:1977)	Greater than 100M Ω @ 500VDC.	
Environment: (IEC 68-2-2)	Temperature: Operating: -20°C to +55°C, Storage -20°C to +70°C Humidity: 12 Cycles to 55°C and 93% RH. Shock: Operational: 11ms duration, 100m/s ² peak (10g), 10 pulses in each plane, no contact separation. Survival: 11ms duration, 150m/s ² peak (15g) 10 pulses in 3 directions. Vibration: IEC 255-21-1, Class 1. Seismic: IEEE 344-1975 para 6.3.1.	
Electro Magnetic:	Radiated Immunity & Fast Transient: EN 50082-1 & EN 50082-2	
Compatibility:	Radiated & Conducted Emissions: EN 50081-1 & EN 50081-2.	
Mechanical Life:	6 x 10 ⁶ operations for standard relay	
Weight:	750g (Standard D2600 relay with D2600/RT socket)	

2. Setting and Configuration

2.1 Operating Voltage

Standard operating voltages available are 12V, 24V, 36V, 50V 110V and 240V. The operating voltage specified at the time of ordering is printed on the front plate of the relay (figure1). The operating supply is passed through a bridge rectifier circuit (on the control PCB) providing polarity correction for DC operation and full wave rectification for AC operation at the specified voltage.

2.2 Contacts

Relays are supplied with 4 sets of volt free contacts. The standard contact configuration is 2xMake (normally open) and 2xBreak (normally closed) volt free silver (Ag) contacts. All contact (make/break) configurations are available in the contact materials described in section 3. Contact sales for assistance.

2.3 Non-interchangeability

All D2600 relays and sockets can be fitted with (male/female) fouling pin arrangements. Only relays and sockets having the corresponding arrangement will mate with each other to ensure that relays will only fit into the correct circuit location. Fouling pins are fitted to B7 Timing Relays as standard according to their operating voltage (Table 1). Alternative arrangements are available on request (contact sales for details).

Pin	Voltage	Pin	Voltage	Pin	Voltage
U	24 V	W	12 V	Y	110 V
V	50 V	X	50 V	Z	240 V

2.4 Delay to Operate Time Setting

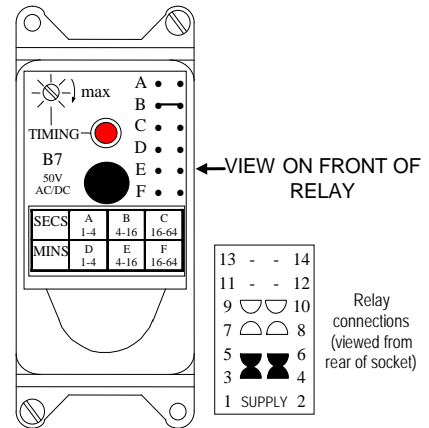
The delay to operate time period is determined by the link option (A-F) selected at time of ordering (see table 2) and by the Timing control pot (VR1) adjustment set by the user. The delay to operate timing period is indicated by a RED LED indicator light. When the operate supply is connected to terminals 1 and 2 the RED LED illuminates indicating the relay is in delayed operation mode. The RED LED extinguishes when the relay times out and enters normal operating mode (coil fully energised and contacts have switched). The relay will de-energise when the operate supply is removed.

Caution High Voltage observe electrical safe handling precautions at all times. High voltages may be present inside the cover of the relay irrespective of the voltage printed on the relay cover plate or the operational status of the relay. **Do not touch** any of the internal contacts or conductors. It is recommended that only qualified personnel be authorised to remove the cover of the relay or make setting adjustments.



To set the delay period, remove the transparent cover by unscrewing the black cover knob. Using an insulated trimming tool adjust the timing control pot (VR1) clockwise to increase the delay time period (see figure 1) or anticlockwise to decrease the delay time period. The delay to operate time period can be determined by monitoring the LED 'ON' time. Refit cover and secure with the black cover knob.

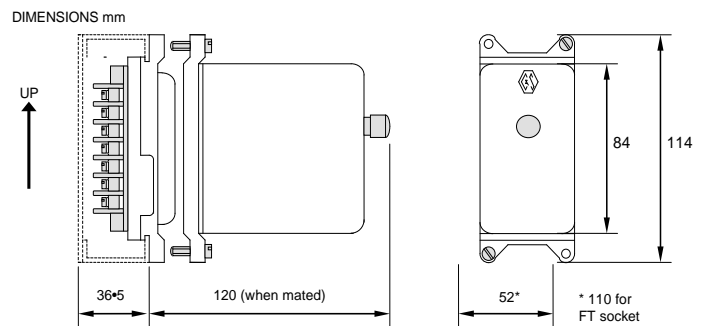
Delay	Link	Delay	Link	Delay	Link
1-4 secs	A	4-16 secs	B	16-64 secs	C
1-4 mins	D	4-16 mins	E	16-64 mins	F



Remove transparent cover to set delay period

Figure 1

The relay options selected at time of ordering are printed on the faceplate of the relay. The time delay option is indicated by the line drawn to represent the selected link option as shown in figure 1 above (link B, 4-16 seconds delayed operation; 50V AC/DC operating voltage).

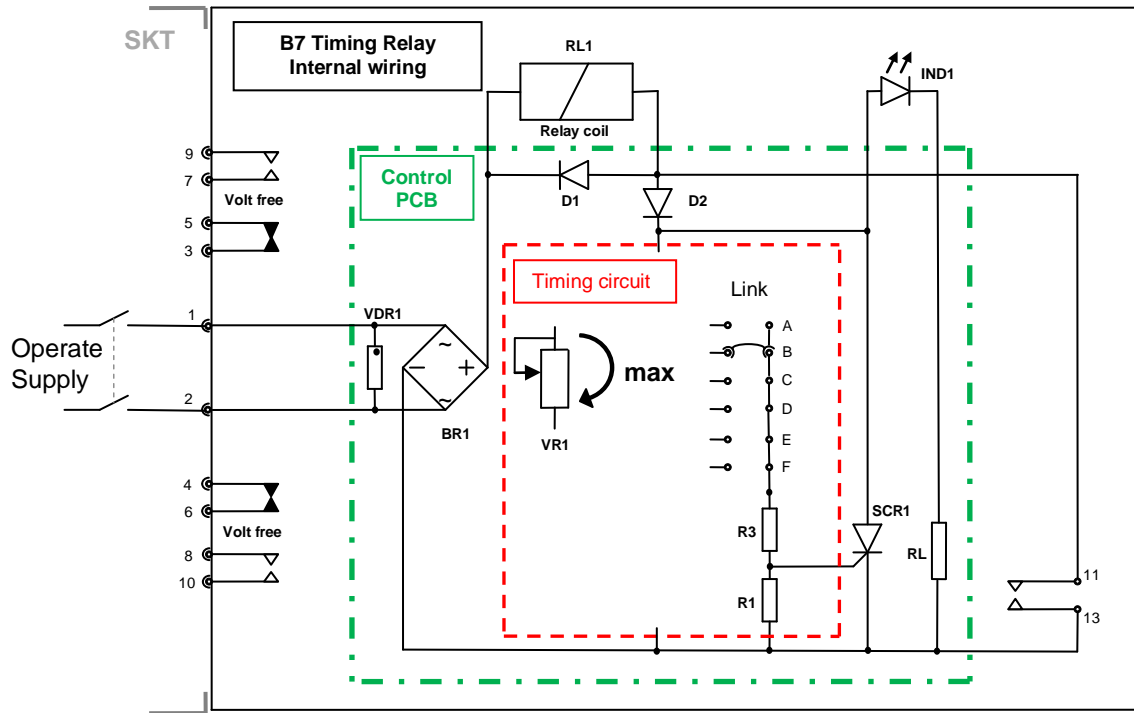


RELAY OUTLINE DRAWING (shown with RT SOCKET AND 35mm RACK)

Figure 2

For full details and range of Mounting Racks and Sockets available, refer D2600 Relay data sheet.

2.5 B7 Timing Relay Diagram



Link 'B' (4-16 sec delay) + 2Make, 2Break volt free contact options shown.
Pins 11, 12, 13, 14 not available external to unit

3. Contact Materials & Rating

The information given below is for guidance only and derives from tests on D2600 Relay contacts used under 'normal' operating conditions. For abnormal or critical applications, tests should be carried out to confirm suitability of selected contact material(s).

3.1 Silver Contacts (Ag)

These are the standard contacts for most applications. Each contact pair is capable of switching the loads given in the table, but subject to the 'Relay Total Current Carrying Capacity' as defined below

AC LOADS	
250VAC @ 10A max. With a power factor of not less than 0.8	For more inductive loads multiply the max. current (10A) by the power factor to determine the switching current.

DC LOADS (Non-inductive)	
250VDC @ 0.5A max	For intermediate values interpolate between the <u>nearest</u> two levels
130VDC @ 0.5A max	
85VDC @ 1.5A max	
50VDC @ 5A max	
35VDC @ 7A max	

3.2 Palladium Copper (PdCu)

These contacts are virtually tarnish-free in normal atmospheres. They have a smaller contact dome to provide higher contact pressure and more wiping action. Mainly used for low energy switching (typically 5V @ 10mA), but they will handle up to 2A (subject to a maximum of 40W or 40VA), specified by adding PdCu to the relay descriptive code.

3.3 Silver Cadmium Oxide (D54X)

A hard sintered alloy recommended for heavy duty applications and inductive loads. It is less prone to material transfer than Silver on DC circuits, but it is not suitable for low voltage low current applications. Silver Cadmium Oxide can be used for switching AC loads and for intermediate DC loads. Switching capacity is the same as for silver contacts but contact life will be improved due to the greater arc resistance of these contacts. Specified by adding 'D54X' to the relay descriptive code.

3.4 Arc Suppression

Magnetic Bow-outs cannot be fitted to the B7 Timing Relay. External arc suppression (e.g. diodes or VDRs) should be considered for inductive loads where contact arcing is likely to occur.

3.5 Relay Total Current Carrying Capacity

To limit internal heating, relays are subject to a maximum overall relay current calculated as follows:

$$I_1^2 + I_2^2 \dots I_N^2 \leq 100$$

Where I_1 etc. are the currents carried simultaneously by individual contacts. Where possible the current should be shared between two contact stacks for optimum heat distribution within the relay. Individual contact loading must not exceed the specified limit for the contact material.

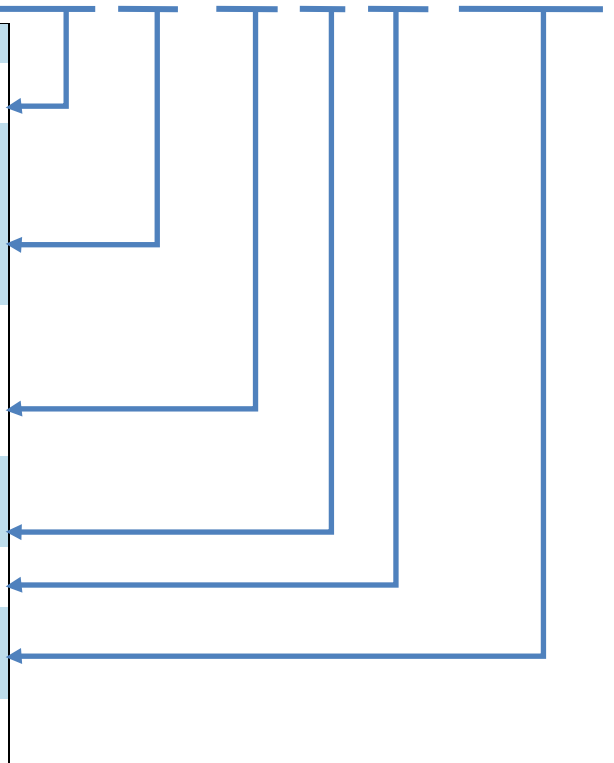
3.6 Electrical Contact Life

For light loads the contact life will approach the mechanical life of the relay. This will be reduced in more arduous duty depending on load (particularly breaking of heavy inductive DC loads), frequency and number of operations and local environmental conditions.

4. Relay Code Recognition

Example of Relay Descriptive code = **TIMER * B7/2M2B/D54X/FPY/110V/4-16SECS**

B7 Timing Relay D5455/B7	
TIMER B7	Product identifier
* D5455/	Drg. number recognised by utilities (can be omitted)
Contact arrangement	Section 2.2
4M	4 Make (normally open)
4B	4 Break (normally closed)
3M1B	3 Make + 1Break
2M2B	2 Make + 2Break (Standard contact arrangement)
1M3B	1 Make + 3Break
Contact material[†]	Section 3
Unspecified	Silver (standard)
Ag [§]	Silver
PdCu	Palladium Copper
D54X	Silver Cadmium Oxide
Non-interchangeability[†]	
FP##	Fouling pin code (section 2.3)
Coil Voltage[†]	
###V	DC and AC (50-110Hz) operation (section 2.1)
Delay Time Range	see table 2 for time ranges available
## – ## SECS	min – max delay time in seconds
## – ## MINS	min – max delay time in minutes
[†] contact sales for options available, [§] quoted when silver contacts set are used in combination with PdCu or D45X	



Notes:

- 1) Relays and sockets are allocated a unique computer code (e.g. 2RB070702), which will be quoted on our order acknowledgement. This will be marked on the relay as a shortened reference code (e.g. RB070702). These codes must be quoted whenever possible to ensure that the correct relay is supplied, particularly for replacement or spares orders.
- 2) Always quote the fouling pin (FP) code when ordering new or replacement sockets for Relays fitted with fouling pins. The FP code will be marked on both the relay and socket.
- 3) The order of the descriptive elements in the code may not always be exactly as shown above. This is not critical as long as all relevant elements are included.
- 4) Other features not covered by the relay code system should be included in the Relay Description e.g. contacts 7/9; 8/10 D54X BALANCE Ag.